

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

THE TRUSTEES OF PURDUE UNIVERSITY,

Plaintiff,

vs.

STMICROELECTRONICS INTERNATIONAL N.V.,  
AND STMICROELECTRONICS, INC.

Defendants.

CASE NO. 6:21–CV–00727-ADA

JURY TRIAL DEMANDED

**STMICROELECTRONICS INTERNATIONAL N.V.’S ANSWER TO THE TRUSTEES OF PURDUE  
UNIVERSITY’S SECOND AMENDED COMPLAINT AND COUNTERCLAIMS**

Defendant STMicroelectronics International N.V. (“ST Int’l”) responds to The Trustees of Purdue University’s (“Purdue”) Second Amended Complaint for Patent Infringement [ECF 154, granted leave to file on December 2, 2022 per the Court’s order at ECF 206] as follows:

**PARTIES**

1. ST Int’l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 1, and therefore denies them.

2. ST Int’l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 2, and therefore denies them.

3. ST Int’l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 3, and therefore denies them.

4. ST Int’l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 4, and therefore denies them.

5. Paragraph 5 contains Purdue’s legal contentions to which no response is required. To the extent a response is required, ST Int’l denies the allegations in paragraph 5, and

specifically denies that Purdue may claim sovereign immunity from *inter partes* review, *ex parte* reexamination, or other post-grant proceeding at the United States Patent and Trademark Office. *See, e.g., Regents of the Univ. of Minn. v. LSI Corp.*, 926 F.3d 1327 (Fed. Cir. 2019).

6. ST Int'l admits that it is a wholly-owned subsidiary of STMicroelectronics N.V., and is a company incorporated under the laws of the Netherlands, having its registered offices at WTC Schiphol Airport, Schiphol boulevard 265, 1118 BH Luchthaven Schiphol, Amsterdam, The Netherlands, acting through its Swiss branch at 39, Chemin du Champdes-Filles, CH-1228 Geneva – Plan-Les-Ouates, Switzerland.

7. ST Int'l denies that it makes, uses, sells, offers for sale, or imports SiC power MOSFETs under STMicroelectronics N.V.'s ("STNV") supervision, direction and control. In addition, ST Int'l also denies that it directs and controls others, such as STMicroelectronics, Inc. ("ST Inc."), to make, use, sell, offer for sale, or import SiC power MOSFETs into the United States. On information and belief, ST Int'l denies the remaining allegations in paragraph 7.

8. ST Int'l denies that by design and on purpose it places STPOWER SiC MOSFETS into the stream of commerce throughout the United States via an established distribution channel. On information and belief, ST Int'l denies the remaining allegations in paragraph 8.

9. ST Int'l admits that it owns U.S. Trademark Registration Nos. 6,121,354 and 4,442,278.

10. ST Int'l lacks sufficient knowledge or information to form a belief as to the allegations in paragraph 10 and therefore denies the allegations.

11. ST Int'l denies that it has "over 80 sales & marketing offices in 35 countries, including the office located at 8501 N. Mo-Pac Expressway, Suite 420, Austin, Texas 78757."

On information and belief, ST Int'l denies the remaining allegations in paragraph 11.

12. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 12, and therefore denies them.

13. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 13, and therefore denies them.

14. The allegations in paragraph 14 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 14, and therefore denies them.

15. The allegations in paragraph 15 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 15, and therefore denies them.

16. The allegations in paragraph 16 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 16, and therefore denies them.

17. The allegations in paragraph 17 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 17, and therefore denies them.

18. The allegations in paragraph 18 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 18, and therefore denies them.

19. Responding to the allegations in paragraph 19, ST Int'l admits that certain datasheets, flyers, and other marketing materials for SiC power MOSFETs contain ST Inc.'s registered trademarks.

20. The allegations in paragraph 20 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 20, and therefore denies them.

21. The allegations in paragraph 21 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 21, and therefore denies them.

22. The allegations in paragraph 22 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 22, and therefore denies them.

### **JURISDICTION**

23. Responding to the allegations in paragraph 23, ST Int'l admits that Purdue's allegations purport to arise under the patent laws of the United States, and that this Court has subject matter jurisdiction over such claims.

24. The allegations in paragraph 24 are not directed to ST Int'l and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 24, and therefore denies them.

25. Paragraph 25 contains legal conclusions to which no response is required. To the extent a response is required, ST Int'l admits that it has appeared in this action and—for the purposes of this action only—is not contesting personal jurisdiction. ST Int'l denies the remaining allegations in paragraph 25.

26. Paragraph 26 contains legal conclusions to which no response is required. To the extent a response is required, ST Int'l admits that Purdue has sued ST Int'l for patent infringement pursuant to 35 U.S.C. § 271, that ST Int'l is a foreign corporation and not subject to any state's courts of general jurisdiction and—for the purposes of this action only—is not contesting personal jurisdiction. ST Int'l denies the remaining allegations in paragraph 26.

27. ST Int'l denies that it, directly and/or through its subsidiaries and agents (including distributors, retailers, and others) has makes, imports, ships, distributes, offers for sale, sells, uses, or advertises SiC MOSFETs in the United States. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the remaining allegations in paragraph 27, and therefore denies them.

28. ST Int'l denies that any of the defendants has infringed the '633 Patent. In addition, ST Int'l denies that it, directly and/or through its subsidiaries and agents (including distributors, retailers, and others) has purposefully and voluntarily placed one or more of the accused products into the stream of commerce throughout the United States with the expectation that the products will be purchased and used by customers in this District. ST Int'l lacks

sufficient knowledge or information to form a belief as to the truth of the remaining allegations in paragraph 28, and therefore denies them.

29. Paragraph 29 contains legal conclusions to which no response is required. To the extent a response is required, ST Int'l states that—for the purposes of this action only—is not contesting personal jurisdiction. ST Int'l denies the remaining allegations in paragraph 29.

30. ST Int'l states that it is not contesting that it is subject to specific personal jurisdiction in this Court for the purposes of Purdue's Complaint. ST Int'l denies the remaining allegations in paragraph 30.

### VENUE

31. The allegations in paragraph 31 are not directed to ST Int'l and are legal conclusions and therefore require no response. To the extent a response is required, ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 31, and therefore denies them.

32. The allegations in paragraph 32 are legal conclusions and therefore require no response. To the extent as response is required, ST Int'l does not contest that venue is proper in this District under 28 U.S.C. §§ 1391(b) solely for the purpose of this action, but denies that venue is convenient or in the interests of justice under 28 U.S.C. § 1404(a). ST Int'l denies the remaining allegations in paragraph 32.

33. Paragraph 33 contains Purdue's legal contentions to which no response is required. To the extent a response is required, ST Int'l denies the allegations in paragraph 33, and specifically denies that Purdue may claim sovereign immunity from claims or counterclaims in this Court or administrative tribunals, such as *inter partes* review, *ex parte* reexamination, or

other post-grant proceeding at the United States Patent and Trademark Office. *See, e.g., Regents of the Univ. of Minn. v. LSI Corp.*, 926 F.3d 1327 (Fed. Cir. 2019).

**U.S. PATENT NO. 7,498,633**

34. Responding to the allegations in paragraph 34, ST Int'l admits that Exhibit A to Purdue's Complaint (ECF No. 1) purports to be a copy of the '633 Patent, which bears the title "High-Voltage Power Semiconductor Device" and an issue date of March 3, 2009. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the remaining allegations in paragraph 34, and therefore denies them.

35. ST Int'l admits that only that first page of the '633 Patent states that it issued from U.S. Patent Application No. 11/338,007, which the '633 Patent states was filed on January 23, 2006, and that the '633 Patent claims priority to U.S. Provisional Application No. 60/646,152, which the '633 Patent states was filed on January 21, 2005. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the remaining allegations in paragraph 35, and therefore denies them.

36. Responding to the allegations in paragraph 36, ST Int'l denies that the purported inventions claimed in the '633 Patent are useful, novel, and non-obvious. ST Int'l specifically denies that the asserted claims of the '633 Patent are valid. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of any remaining allegations in paragraph 36, and therefore denies them.

37. Responding to the allegations in paragraph 37, ST Int'l admits that the reproduced text appears to be the text of claim 9 of the '633 Patent. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of any remaining allegations in paragraph 37, and therefore denies them.

38. Responding to the allegations in paragraph 38, ST Int'l admits that the reproduced text appears to be the text of claim 10 of the '633 Patent. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of any remaining allegations in paragraph 38, and therefore denies them.

39. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 39, and therefore denies them.

40. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 40, and therefore denies them.

41. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 41, and therefore denies them.

42. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 42, and therefore denies them.

43. ST Int'l denies the allegations in paragraph 43.

44. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 44, and therefore denies them.

45. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 45, and therefore denies them.

#### **INFRINGEMENT OF THE '633 PATENT**

46. ST Int'l denies the allegations in paragraph 46. ST Int'l specifically denies that it directly, indirectly, or willfully infringes the '633 Patent.

47. ST Int'l denies the allegations in paragraph 47.



48. Responding to the allegations in paragraph 48, ST Int'l denies that ST Inc.'s SiC MOSFETs (such as the SCTW90N65G2V), are or include a "metal-oxide-semiconductor field-effect-transistor" as this term is used in the preamble to claims 9 and 10 of the '633 Patent.

49. ST Int'l denies the allegations in paragraph 49.

50. ST Int'l lacks sufficient knowledge or information to form a belief as to the truth of the allegations in paragraph 50, and therefore denies them.

51. ST Int'l denies the allegations in paragraph 51.

52. ST Int'l denies the allegations in paragraph 52.

53. ST Int'l denies the allegations in paragraph 53.

54. ST Int'l denies the allegations in paragraph 54.

55. ST Int'l incorporates by reference its responses to the foregoing paragraphs. ST Int'l denies the remaining allegations in paragraph 55. ST Int'l specifically denies that it infringes the '633 Patent.

56. ST Int'l denies the allegations in paragraph 56. ST Int'l specifically denies that it directly or indirectly infringes the '633 Patent.

57. ST Int'l denies the allegations in paragraph 57. ST Int'l specifically denies that it directly or indirectly infringes the '633 Patent.

58. ST Int'l denies the allegations in paragraph 58. ST Int'l specifically denies that it directly or indirectly infringes the '633 Patent.

59. ST Int'l denies the allegations in paragraph 59. ST Int'l specifically denies that it directly, indirectly, or willfully infringes the '633 Patent.

60. ST Int'l denies the allegations in paragraph 60. ST Int'l specifically denies that it directly, indirectly, or willfully infringes the '633 Patent.

**RESPONSE TO DEMAND FOR JURY TRIAL**

61. ST Int'l requests a trial by jury on all issues so triable.

**RESPONSE TO PRAYER FOR RELIEF**

62. To the extent that a response to Purdue's Prayer for Relief is appropriate, ST Int'l denies that Purdue is entitled to any requested relief.

**AFFIRMATIVE DEFENSES**

63. ST Int'l alleges and asserts the following defenses in response to the allegations in Purdue's Complaint. ST Int'l reserves the right to rely on any other defense that may become available or known throughout the course of discovery in this case, and reserves the right to amend this Answer to assert any such defense. Assertion of a defense is not a concession that ST Int'l has the burden of proving the matter asserted.

**FIRST DEFENSE**  
**(Noninfringement)**

64. Purdue's claims are barred, in whole or in part, because ST Int'l does not infringe and has not infringed, directly or indirectly, literally or under the doctrine of equivalents, any valid and enforceable claim of the '633 Patent as required by 35 U.S.C. § 271.

**SECOND DEFENSE**  
**(Invalidity)**

65. Each asserted claim of the '633 Patent is invalid for failure to comply with one or more of the requirements of Title 35, United States Code, including, without limitation, 35 U.S.C. §§ 101, 102, 103, 112, and/or 116, the non-statutory doctrine of double patenting, incorrect inventorship, and the rules, regulations, and laws pertaining thereto.

**THIRD DEFENSE**  
**(Limitation on Damages)**

66. Purdue's claims for damages are statutorily limited or barred by 35 U.S.C. § 286.

**FOURTH DEFENSE**  
**(Prosecution History Estoppel)**

67. Purdue is estopped from construing any valid claim of the ‘633 Patent to cover or include, either literally or by application of the doctrine of equivalents, any product or service made, used, sold, offered for sale or imported by ST Int’l because of admissions and statements made to the United States Patent and Trademark Office (“PTO”) during prosecution of the application leading to the issuance of the ‘633 Patent.

**FIFTH DEFENSE**  
**(License/Exhaustion)**

68. To the extent that any manufacture, use, sale, offer for sale, or importation into the United States of the Accused Products, any component thereof, or any products in which the component is integrated were authorized by Purdue or any of its successors in interest, Purdue’s claims are precluded under the doctrine of implied or express license, or by the doctrine of patent exhaustion.

**SIXTH DEFENSE**  
**(Failure to Mark)**

69. To the extent that Purdue, its alleged predecessors in interest to the ‘633 Patent, and any and all licensees of the ‘633 Patent failed to properly mark any of their relevant products as required by 35 U.S.C. § 287 or otherwise give proper notice that ST Int’l’s actions allegedly infringed the ‘633 Patent, ST Int’l is not liable to Purdue for the acts alleged to have been performed before receiving actual notice that it was allegedly infringing the ‘633 Patent.

**SEVENTH DEFENSE**  
**(Inequitable Conduct)**

70. All of the claims of the ‘633 Patent are unenforceable due to inequitable conduct.

71. Purdue claims that the '633 Patent was duly and legally issued by the PTO on March 3, 2009, and purports to relate “to useful, novel, and non-obvious semiconductor devices for high-voltage power applications.” Further, by virtue of its infringement allegations, Purdue implies that the '633 Patent is enforceable.

72. ST Int'l denies the enforceability of the '633 Patent and alleges that all of the claims of the '633 Patent are unenforceable due to inequitable conduct.

73. Specifically, on information and belief and subject to ST Int'l's continuing investigations and discovery, the named inventors and/or their representatives failed to disclose material information and made affirmatively misleading and/or false statements to the PTO during prosecution of the '633 Patent.

74. The '633 Patent issued from U.S. Patent Application No. 11/338,007 (“the '007 Application”), which was filed on January 23, 2006.

75. The named inventors on both the '007 Application were James A. Cooper, Ph.D. and Asmita Saha, Ph.D. Both applications were assigned to Purdue Research Foundation of West Lafayette, Indiana (the named inventors and Purdue Research Foundation are collectively referred to herein as the “Patentees”).

76. On information and belief, the Purdue Research Foundation is a private, nonprofit foundation “created to advance the mission of Purdue University” and “protect[] Purdue’s intellectual property.”<sup>1</sup>

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<sup>1</sup> About PRF, Purdue Research Foundation, <https://prf.org/about/index.html> (last visited Sept. 29, 2021).

77. The attorneys prosecuting the '007 Application on behalf of Purdue Research and the named inventors were Bradford G. Addison and Glen M. Kellett of Barnes & Thornburg LLP.

78. Each individual associated with the filing and prosecution of a patent application has an absolute duty of candor and good faith in dealing with the PTO. 37 C.F.R. § 1.56. This duty includes the duty to disclose information that is material to patentability. A breach of this duty may constitute inequitable conduct, or “fraud on the Patent Office,” rendering the patent unenforceable.

79. Each of the named-inventors of the '633 Patent signed declarations under oath acknowledging their duty of candor and acknowledging that willful false statements may jeopardize the validity of the applications or any patents issued thereon.

80. The written description in the application leading to the issuance of the '633 Patent stated that the purported invention “relates generally to semiconductor devices, and more particularly to semiconductor devices for high-voltage power applications.”

81. During prosecution of the '633 Patent, the Patentees knew of specific prior art disclosures, knowledge of a person of ordinary skill in the art (“PHOSITA”), and their specific materiality to one or more aspects of the claimed inventions and/or the reasons for allowance. The Patentees, however, did not disclose these material references and also misrepresented the PHOSITA’s knowledge to the Examiner.

82. As one example, at least Dr. Cooper is a prolific writer who has authored or co-authored numerous technical publications, including, at one point, reportedly over 250 technical

papers and conference presentations, five book chapters, 18 U.S. patents, and a textbook on silicon carbide (SiC) technology.<sup>2</sup>

83. More specifically, prior to the application for the '633 Patent, Dr. Cooper had authored or co-authored numerous articles, papers, and reports relating to the design and manufacture of silicon-carbide semiconductor devices.

84. On information and belief and subject to ST Int'l's continuing investigation and discovery, Dr. Cooper and the Patentees were aware of other articles on SiC semiconductor devices before and during prosecution of the '633 Patent.

85. However, Dr. Cooper and the Patentees did not disclose any prior art (e.g., any patents, patent applications, articles, publications, etc.) to the Examiner in connection with the prosecution of the '633 Patent, even though such references were material to the claims being prosecuted.

86. On October 12, 2007, during prosecution of the '633 Patent, the Examiner issued a Final Rejection rejecting claims 1, 3, 4, 7–10, 12, and 13 under 35 U.S.C. § 103(a) as being unpatentable over Ono (U.S. Patent Application Pub. No. 2003/0227052) in view of Kumar (U.S. Patent No. 6,573,534) and further in view of Zeng (U.S. Patent No. 6,137,139). The Examiner explained as follows:

As to claims 1, 3, 4, 9, 12, and 13, Ono discloses and shows (Fig 1), a double implanted MOS field effect transistor comprising a semiconductor substrate (10) having a first concentration of first type impurities (n+); a drift semiconductor layer (50) formed on a front side of the semiconductor substrate and having a second concentration of first type impurities less than the first concentration of first type impurities (n-); a first source region (20); a second

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<sup>2</sup> Dr. James A. Cooper, Real Engineers Get their Hands Dirty, Purdue University, College of Engineering – Academic Affairs, <https://engineering.purdue.edu/Engr/AboutUs/Administration/AcademicAffairs/Events/Colloquia/cooper> (last visited Sept. 29, 2021).

source region (20); and a JFET region (40) defined between the first source region and the second source region, the JFET region having a third concentration of first type impurities that is greater than the second concentration of first type impurities (n) and having a width (L) less than about 3 micrometers and a width of about one micrometer. (Paragraphs [0039] & [0041 ]).

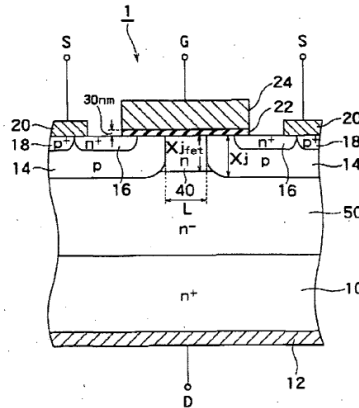


FIG. 1

Ono does not disclose that the semiconductor substrate is a silicon-carbide substrate.

Kumar is related to a similar MOS FET structure and discloses that the substrate is a silicon-carbide substrate (Column 1, line 40).

Kumar is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a silicon-carbide substrate.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono by using a silicon-carbide substrate for advantages such as higher breakdown voltage and lower ON resistance according to the teachings of Kumar (Column 1, lines 27-30).

87. On March 12, 2008, the Patentees responded to the October 12, 2007 Final

Rejection and argued as follows:

Applicants respectfully traverse these rejections. As discussed in detail below, Applicants believe that no rational reason exists why one of ordinary skill in the art would combine Ono, Kumar, and Zeng in the manner described. Applicants assert that no such reason exists because the proposed combination would render the device of Ono unsatisfactory or inoperable for its intended purpose. Thus,

Ono, Kumar, and Zeng teach away from the proposed combination and cannot support a finding of obviousness.

I. References Teach Away from Proposed Combination

Applicants assert that no rational reason exists to combine Ono, Kumar, and Zeng in the manner described by the Examiner because the cited references teach away from the proposed combination.

...

The semiconductor device of Ono would be render [sic] unsatisfactory or inoperable for its intended purpose if modified to include the structures of Zeng and Kumar as proposed by the Examiner. As noted by the Examiner, Ono and Zeng are directed toward MOSFET devices having silicon substrates, while Kumar is directed toward silicon-carbide MOSFET devices. Although the Examiner asserts that modifying Ono to include a silicon-carbide is an obvious modification, such an assertion ignores the technical aspects of silicon-carbide MOSFET devices.

88. The Patentees made a material misrepresentation during prosecution of the '633 Patent by stating, for example, that it would not be obvious to modify the silicon substrate devices disclosed in the cited references to include those structures in silicon-carbide. At the time Patentees made these misrepresentations to the Examiner, however, the Patentees (including Dr. Cooper, in particular) were aware of prior art publications disclosing very similar structures in silicon-carbide. But the Patentees did not disclose such material prior art or information to the examiner.

89. As one example, in April 2002, nearly six years before the Patentees responded to the Examiner's rejection, Dr. Cooper authored an IEEE paper entitled "Status and Prospects for SiC Power MOSFETs" (the "Cooper IEEE Paper") in which he discussed similar silicon-carbide



structures.<sup>3</sup> Neither Dr. Cooper nor the other Patentees disclosed the Cooper IEEE Paper to the PTO in connection with the prosecution of the '633 Patent.

90. As another example, the Patentees were aware of a paper entitled "A Self-Aligned Process for High-Voltage, Short-Channel Vertical DMOSFETs in 4H-SiC," IEEE Trans on Electron Devices, Vol. 51, No. 10, Oct. 2004, produced as PU00023605 ("Matin") in which he discussed similar silicon-carbide structures. Neither Dr. Cooper nor the other Patentees disclosed the Matin IEEE Paper to the PTO in connection with the prosecution of the '633 Patent.

91. As yet another example, the Patentees were aware of book by B. Jayant Baliga entitled "Modern Power Devices," in which he discussed similar silicon-carbide structures. Neither Dr. Cooper nor the other Patentees disclosed the Baliga book to the PTO in connection with the prosecution of the '633 Patent.

92. In yet another example, the Patentees were aware of a December 2003 paper by Chao-Yang Lu entitled "Design and Fabrication of High Performance UMOSFETs In 4H SiC" ("Lu") in which he discussed similar silicon-carbide structures. Neither Dr. Cooper nor the other Patentees disclosed the Lu paper to the PTO in connection with the prosecution of the '633 Patent.

93. In yet another example, the Patentees were aware of an April 2002 paper by Imran A. Khan entitled "High Voltage UMOSFETs in SiC" ("Khan") in which he discussed similar silicon-carbide structures. Neither Dr. Cooper nor the other Patentees disclosed the Khan paper to the PTO in connection with the prosecution of the '633 Patent.

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<sup>3</sup> See, e.g., James A. Cooper et al., Status and Prospects for SiC Power MOSFETs, 49 IEEE Transactions on Electron Devices, No. 4, 658, 658–61 & Figs. 1–4 (Apr. 2002).

94. In yet another example, the Patentees were aware of a December 2002 paper by Maherin Matin entitled “4H-SiC Power DMOSFETs” (“Matin”) in which he discussed similar silicon-carbide structures. Neither Dr. Cooper nor the other Patentees disclosed the Matin paper to the PTO in connection with the prosecution of the ’633 Patent.

95. On information and belief, several of Dr. Cooper’s other prior art publications disclose similar structures in silicon-carbide to those that were at issue during prosecution of the ’633 Patent.

96. The Patentees not only withheld material prior art from the Examiner but also falsely told the Examiner that the proposed combined structures in silicon-carbide were nonobvious during prosecution of the ’633 Patent.

97. Had the Patentees disclosed the material prior art references that they were aware of to the PTO during the prosecution of the ’633 Patent, the claims would not have issued.

98. In addition, Patentees’ misrepresentations regarding similar structures in silicon-carbide, as well as the nondisclosure of material prior art, were a breach of the duty of candor and good faith because at least Dr. Cooper knew that such information was material to the application that ultimately issued as the ’633 Patent.

99. On information and belief, at least Patentees’ material misrepresentations and failure to disclose material prior art to the PTO during prosecution of the ’633 Patent were done with specific intent to deceive the PTO in order to obtain issuance of the ’633 Patent.

100. As described above, the Patentees’ misrepresentations and failures to disclose known references in spite of the clear materiality of the same to the claims of the application for the ’633 Patent were violations of the duty of candor and good faith in dealing with the PTO. 37 C.F.R. § 1.56 and breach of the oath taken acknowledging their duty of candor.

101. As described above, on information and belief, Patentees' material misrepresentations and failures to disclose material prior art and information to the PTO during prosecution of the '633 Patent were done with specific intent to deceive the PTO in order to obtain issuance of the '633 Patent.

102. On information and belief, at a minimum, Patentees' material misrepresentations and failures to disclose material prior art and information known to the Patentees that would have been relevant to the Examiner during prosecution of the '633 Patent constitute affirmative egregious misconduct.

103. Based at least on the foregoing, Purdue's claims against ST Int'l are barred, in whole or in part, due to the Patentees' inequitable conduct during the prosecution of at least the '633 Patent.

**EIGHTH DEFENSE**  
**(Failure to State a Claim)**

104. Purdue's Complaint fails to state a claim upon which relief can be granted.

**NINTH DEFENSE**  
**(Lack of Standing)**

105. The Trustees of Purdue University lacks standing to assert infringement of the '633 Patent because it did not have sufficient rights in those patents at the time the suit was filed.

**TENTH DEFENSE**  
**(Lack of Standing)**

106. The Trustees of Purdue University has failed to join all necessary parties pursuant to Fed. R. Civ. P. 19.

**ELEVENTH DEFENSE**  
**(Ensnarement)**

107. The Trustees of Purdue University have alleged infringement under the doctrine of equivalents. However, The Trustees of Purdue University have not provided detailed pleadings or claim charts properly alleging infringement under the doctrine of equivalents.

108. Ensnarement bars a patentee from asserting a scope of equivalency that would encompass, or “ensnare,” the prior art.

109. If pursued, The Trustees of Purdue University’s claims of infringement under the doctrine of equivalents are barred due to ensnarement because the alleged equivalents would encompass or “ensnare” the prior art as identified in Defendants’ Invalidity Contentions.

**COUNTERCLAIMS**

Defendant and Counterclaim-Plaintiff ST Int’l, for its counterclaims against Plaintiff and Counterclaim-Defendant Purdue, states as follows:

**NATURE OF THE ACTION**

110. This is an action by Defendant and Counterclaim-Plaintiff ST Int’l pursuant to Rule 13 of the Federal Rules of Civil Procedure for declarations of non-infringement and invalidity of U.S. Patent No. 7,498,633 (“the ’633 Patent”).

**PARTIES**

111. ST Int’l is a company organized under the laws of The Netherlands with an office located at 39, Chemin du Champdes-Filles, CH-1228 Geneva – Plan-Les-Ouates, Switzerland.

112. On information and belief, based on paragraph 1 of the Complaint as pleaded by Plaintiff and Counterclaim-Defendant Purdue, Purdue is a statutory body corporate that operates and conducts a state educational institution having its principal place of business at 610 Purdue Mall, West Lafayette, Indiana 47907.

**JURISDICTION AND VENUE**

113. These Counterclaims arise under the United States patent laws, 35 U.S.C. §§ 1, et seq., and seek relief for which this Court has jurisdiction pursuant to the Declaratory Judgment Act, 28 U.S.C. §§ 2201 and 2202. This Court has subject matter jurisdiction over these Counterclaims pursuant to 28 U.S.C. §§ 1331 and 1338(a).

114. This Court has personal jurisdiction over Purdue by virtue of its sufficient minimum contacts with this forum at least as a result of the filing of its case against ST Int'l in this jurisdiction.

115. By filing in this District, Purdue has consented that venue for these Counterclaims is proper in this District under 28 U.S.C. § 1400(b).

116. An actual, substantial, and continuing justiciable controversy exists between Purdue and ST Int'l based at least on Purdue filing a complaint against ST Int'l alleging infringement of the '633 Patent, with respect to which ST Int'l requires a declaration of its rights by this Court. Specifically, the controversy concerns the noninfringement and invalidity of the '633 Patent and Purdue's right to maintain suit for alleged infringement of the '633 Patent.

**FIRST COUNTERCLAIM**  
**(Declaration of Noninfringement of the '633 Patent)**

117. ST Int'l re-alleges and incorporates by reference the allegations set forth in paragraphs 110-116 of these Counterclaims.

118. Purdue claims that the '633 Patent was issued on March 3, 2009, by the PTO. Purdue claims ownership by assignment of the '633 Patent.

119. Purdue has alleged that ST Int'l has infringed, and continues to infringe, the '633 Patent. An actual, immediate, and justiciable controversy exists between Purdue and ST Int'l over the alleged infringement of the '633 Patent.

120. ST Int'l has not infringed and does not infringe, directly or indirectly, willfully or otherwise, any valid and enforceable asserted claim of the '633 Patent, either literally or under the doctrine of equivalents.

121. A judicial declaration that ST Int'l has not infringed and does not infringe the '633 Patent is necessary and appropriate at this time so that ST Int'l can ascertain its rights and duties with respect to the '633 Patent. ST Int'l has no adequate remedy at law.

122. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. §§ 2201 *et seq.*, and Title 35 of the United States Code, ST Int'l therefore requests a judicial declaration that it has not infringed, and does not infringe, any valid and enforceable claim of the '633 Patent, either directly or indirectly, individually or jointly, or literally or under the doctrine of equivalents.

123. ST Int'l is entitled to further necessary or proper relief based on the Court's declaratory judgment or decree.

**SECOND COUNTERCLAIM**  
**(Declaration of Invalidity of the '633 Patent)**

124. ST Int'l re-alleges and incorporates by reference the allegations set forth in paragraphs 110-123 of these Counterclaims.

125. In its Complaint against ST Int'l, Purdue claims that the '633 Patent was duly and legally issued on March 3, 2009, by the PTO and purports to relate "to useful, novel, and non-obvious semiconductor devices for high-voltage power applications." Purdue claims ownership by assignment of the '633 Patent.

126. Purdue has alleged that ST Int'l has infringed, and continues to infringe, the '633 Patent.

127. The asserted claims of the '633 Patent are invalid for failure to satisfy the conditions of patentability specified in 35 U.S.C. § 101 *et seq.*, including but not limited to 35

U.S.C. §§ 101, 102, 103, 112, and/or 116, the non-statutory doctrine of double patenting, incorrect inventorship, and the rules, regulations, and laws pertaining thereto. An actual, immediate, and justiciable controversy exists between Purdue and ST Int'l over the alleged validity of the asserted claims of the '633 Patent.

128. A judicial declaration that the asserted claims of the '633 Patent are invalid because they fail to satisfy the conditions for patentability specified in Title 35 of the United States Code is necessary and appropriate at this time so that ST Int'l can ascertain its rights and duties with respect to the asserted claims of the '633 Patent. ST Int'l has no adequate remedy at law.

129. Pursuant to the Federal Declaratory Judgment Act, 28 U.S.C. §§ 2201 *et seq.*, and Title 35 of the United States Code, ST Int'l therefore requests a judicial declaration that one or more claims of the '633 Patent are invalid and/or unenforceable at least because they fail to satisfy one or more conditions for patentability specified in 35 U.S.C. § 101 *et seq.*, including but not limited to 35 U.S.C. §§ 101, 102, 103, 112, and/or 116, the non-statutory doctrine of double patenting, incorrect inventorship, and the rules, regulations, and laws pertaining thereto., the non-statutory doctrine of double patenting, incorrect inventorship, and the rules, regulations, and laws pertaining thereto.

130. ST Int'l is entitled to further necessary or proper relief based on the Court's declaratory judgment or decree.

#### **DEMAND FOR JURY TRIAL**

131. ST Int'l. requests a trial by jury on all issues so triable.

#### **PRAYER FOR RELIEF**

ST Int'l respectfully requests that the Court:

1. enter judgment dismissing Purdue's claims against ST Int'l with prejudice;

2. enter judgment denying each of Purdue's requests for relief;
3. enter judgment that ST Int'l has not infringed and does not now infringe any valid and enforceable asserted claims of the '633 Patent;
4. enter judgment that the asserted claims of the '633 Patent are invalid and/or unenforceable;
5. find this to be an exceptional case as a result of Purdue's filing and litigation of this action under 35 U.S.C. § 285 and award ST Int'l its attorneys' fees and costs; and
6. award ST Int'l any other relief the Court deems appropriate and just under the circumstances.



December 16, 2022

Respectfully submitted:

By: /s/ Justin S. Cohen

**Bruce S. Sostek**

SBN 18855700

Bruce.Sostek@hkllaw.com

**Richard L. Wynne, Jr.**

SBN 24003214

Richard.Wynne@hkllaw.com

**Justin S. Cohen**

SBN 24078356

Justin.Cohen@hkllaw.com

**Dina W. McKenney**

SBN 24092809

Dina.McKenney@hkllaw.com

**HOLLAND & KNIGHT LLP**

One Arts Plaza

1722 Routh St., Suite 1500

Dallas, Texas 75201

214.969.1700

**Max Ciccarelli**

SBN 00787242

max@ciccarellilawfirm.com

**CICCARELLI LAW FIRM**

100 N. 6th Street, Suite 502

Waco, Texas 76701

214.444.8869

**Thomas N. Tarnay**

SBN 24003032

ttarnay@tarnaylaw.com

**THOMAS TARNAY PLLC**

2103 Virginia Place

Plano, Texas 75094

214.395.8212

**Michael J. Bettinger**

mbettinger@sidley.com

**SIDLEY AUSTIN LLP**

555 California Street, Suite 2000

San Francisco, CA 94104

(415) 772-1200

**ATTORNEYS FOR DEFENDANT**

**STMICROELECTRONICS INTERNATIONAL N.V.**

**CERTIFICATE OF SERVICE**

I certify that on December 16, 2022, the foregoing document was electronically filed with the Clerk of the Court using CM/ECF, which sent notice of the filing to all case participants.

/s/ Justin S. Cohen  
Justin S. Cohen